

Building Maintenance Systems

manntech

BUILDING MAINTENANCE SYSTEMS

Standard and crane type machines



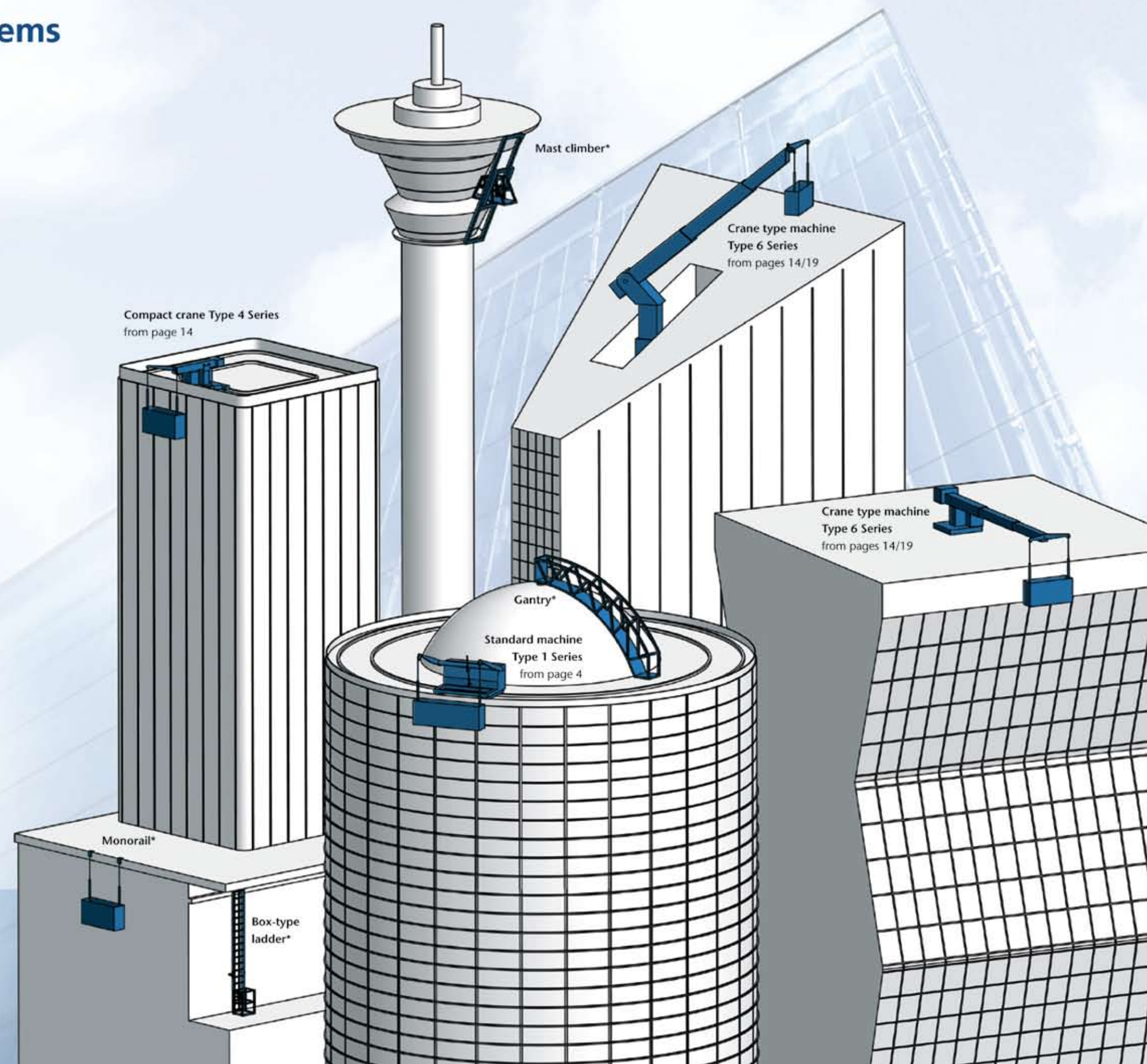
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Building Maintenance Systems

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Standard machines

Type 1 Series

Type 1.1 Standard machine with horizontal track on roof

Type 1.2 Standard machine with vertical track along roof parapet

Type 1.3 Standard machine on roofs with load-bearing concrete runway

Wherever the building's geometry allows, these proven and economical building maintenance systems are deployed on buildings without major protrusions or recesses.

Advantages:

- Simple and safe to operate
- Maintenance-friendly
- More than 55 years' experience with advanced hoist unit technology guarantees highest safety standards
- Can be operated in narrow spaces
- Hardly visible on buildings from ground level when implemented with retractable jibs
- Entrance and exit of the cradle (platform) can be situated at front or rear of the machine, according to preference and local conditions
- Almost unlimited possibilities of combinations and installations based on over 55 years of continuous development
- Hoist will operate for a long period of time without need for overhaul

The technical conception of our machines guarantees immediate operational readiness and high work performance on the façade due to simple handling combined with hands-on training in operation and safety for the operating and building management personnel.



Front machine: Standard Type 1.1 with slewing device

Rear machine: Type 1.1—with 4,000 kg hoisting gear, 286 metres hoisting height and support crane in the cradle (platform) for façade renovation

Type 1.1—Standard machine with horizontal track on roof

Track-based standard system Type 1.1 suitable wherever there is sufficient roof space for installation of track system as close as possible behind the parapet or, respectively, along the roof-edge.

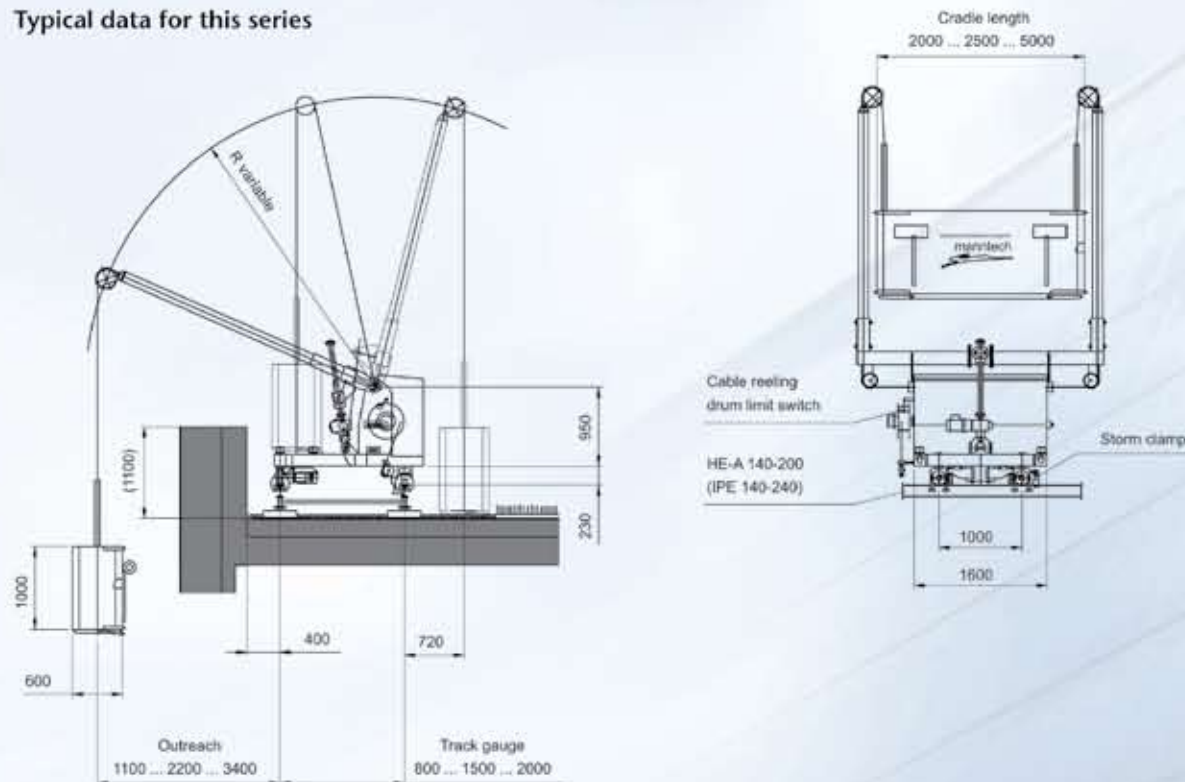
The track system can either be independently laid (i.e. without penetration of roof membrane and compression load only on the support points) or implemented as an anchored rail system fixed to the building structure.

If required, the entire device can be steered into a garage or other parking position using a shunting car.



Type 1.1 with retractable jibs for parked position ►

Typical data for this series



All units metric—also available in SI

Hoist mechanism	Single-layer	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg	240 kg
Height coverage (standard)	39 m	120 m	175 m / 125 m
Rope diameter	7 mm	7 mm	7 mm / 8 mm
Rope safety factor according to EN 1808	>12	>12	>12
Lifting speed	~10 m/min	~11 m/min	~11 m/min
Traversing speed	~10 m/min	~10 m/min	~10 m/min
Length of power cable	20 m	20 m	20 m

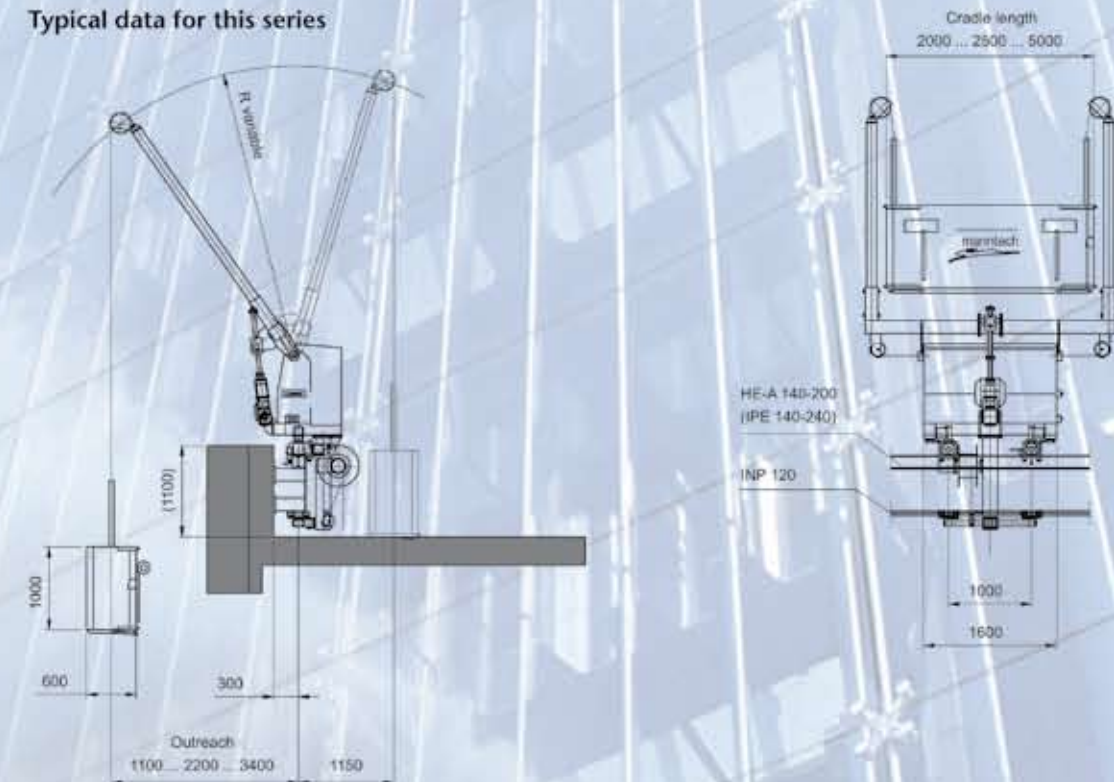
Type 1.2—Standard machine with vertical track along roof parapet



Track-based standard machine Type 1.2 with the track system anchored to the roof parapet. Suitable for use on buildings with a load-bearing parapet. Preferred application for buildings with non-load-bearing roofs and/or insufficient space on the roof. Also suitable for use on buildings with extremely high parapets.

◀ Type 1.2 in parked position with covered work platform

Typical data for this series



All units metric—also available in SI

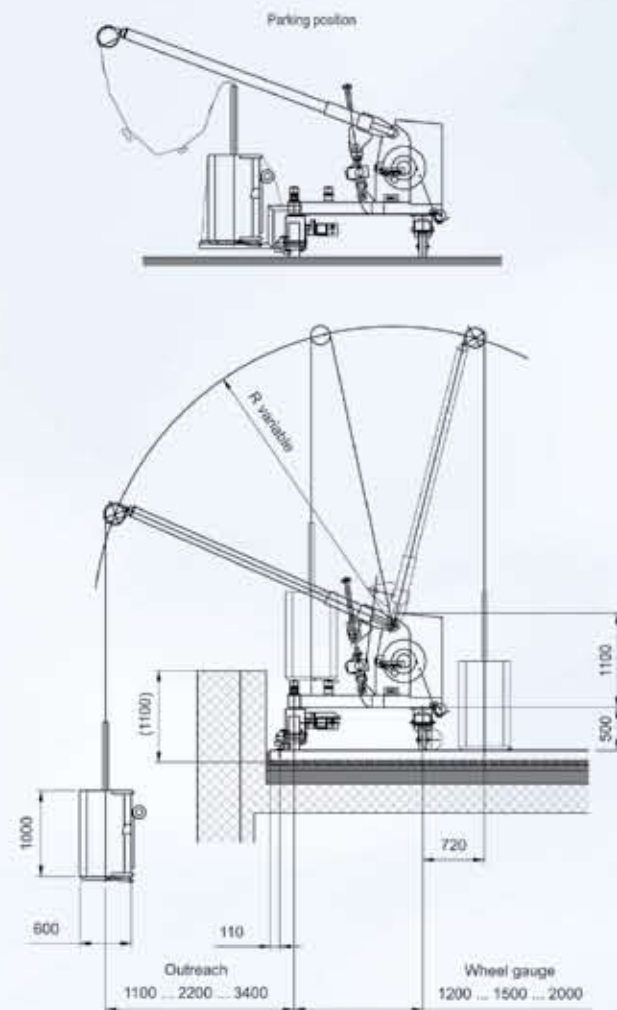
Hoist mechanism	Single-layer	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg	240 kg
Height coverage (standard)	39 m	120 m	175 m / 125 m
Rope diameter	7 mm	7 mm	7 mm / 8 mm
Rope safety factor according to EN 1808	>12	>12	>12
Lifting speed	~10 m/min	~11 m/min	~11 m/min
Traversing speed	~10 m/min	~10 m/min	~10 m/min
Length of power cable	20 m	20 m	20 m

Type 1.3—Standard machine on roofs with load-bearing concrete runway

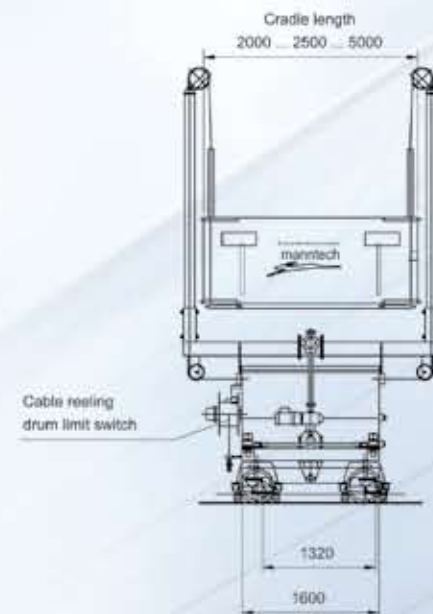
Trackless standard machine Type 1.3 for installation on building roofs with a load-bearing concrete runway. The machine moves on large wheels with durable polyurethane tyres on guide rails or parapet.

The driving surface can be designed to allow the machine to be steered into a parked position away from the building edge. The machine can be mechanically anchored in accordance with the documented standards specified for that country.

Typical data for this series



Type 1.3 with crossbar for load-bearing hoist



All units metric—also available in SI

Hoist mechanism	Single-layer	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg	240 kg
Height coverage (standard)	39 m	120 m	175 m / 125 m
Rope diameter	7 mm	7 mm	7 mm / 8 mm
Rope safety factor according to EN 1808	>12	>12	>12
Lifting speed	~10 m/min	~11 m/min	~11 m/min
Traversing speed	~10 m/min	~10 m/min	~10 m/min
Length of power cable	20 m	20 m	20 m

Type 1.1 and Type 1.3—Standard machines in low profile design



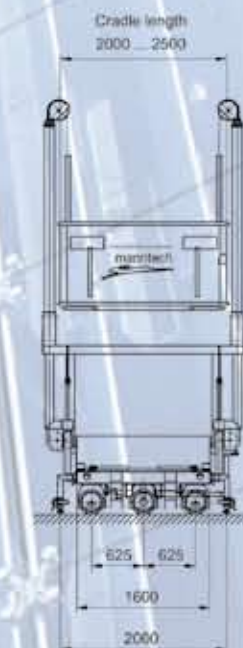
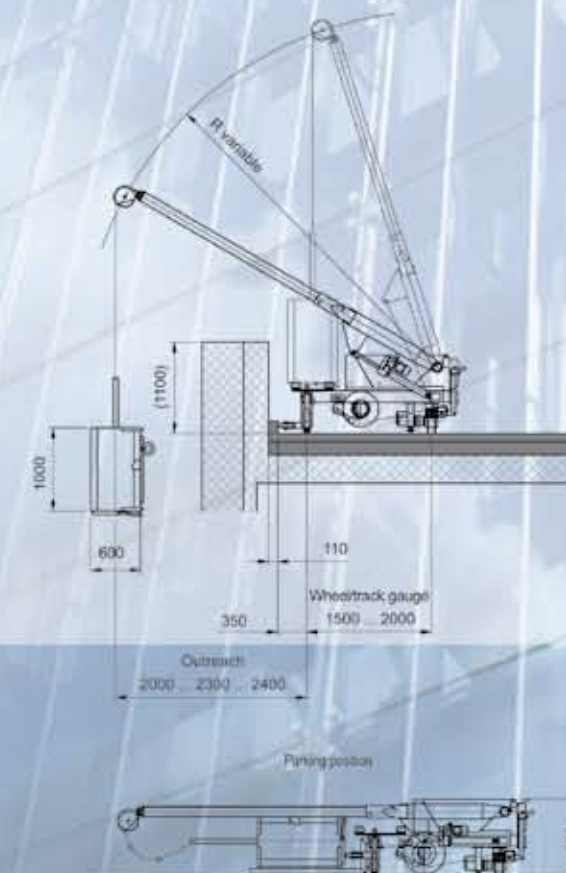
This machine is a special design departure from the standard machines and is characterised by its especially low profile. Particularly in the parked position it offers the advantage of minimum visibility.

The machine can be designed as a track-based system (Type 1.1), or as a trackless system (Type 1.3).

Type 1.1 in parked position



Typical data for this series



All units metric—also available in SI

Hoist mechanism	Single-layer
Rated working load (standard)	240 kg
Height coverage (max.)	39 m
Rope diameter	7 mm
Rope safety factor according to EN 1808	>12
Lifting speed	~10 m/min
Traversing speed	~10 m/min
Length of power cable	20 m

Technical specifications Type 1 Series

Function

Cradle (platform)

Ascends and descends with electrically powered multi-layered safety hoisting gear. In special designs also available as single-layered safety hoisting gear.

Twin jib

Luffing motion using electrically powered trapeze spindle mechanism for safe and simple cradle positioning as well as safe entry and exit.

Traversing gear

Horizontal movement using electrically driven carriage with brakes.

Controls

All movements can be controlled from the cradle (platform) as well as from the roof car via panels. Key-operated and electrical interlock to avoid maloperation.

Quality

Steel structure

Galvanised construction for maximum corrosion resistance, exposed parts mainly made from non-ferrous materials. Primed and painted in RAL colours for optimal corrosion protection.

Suspension ropes

Galvanised high tensile steel ropes with individual certification. Integrated controls ensure safe transmission of signals between roof car and cradle.

Rope guidance

Secure and precise rope guidance for single- or multi-layered safety hoisting gear of the four independent suspension ropes. Pulleys with large diameter made of PA6 (high tensile plastics) for maximum long-lasting rope performance.

Components

From tried and tested systems; dimensioned and optimised solutions based on computer-aided calculation programs.

Cradle (platform)

Aluminium construction with rope suspension attachment made from high tensile steel, rope adjustment and overload device.

Electrical components

Only brand-name products are used with high protection levels against moisture, dirt and extreme environmental influences.

Manoeuvring spindles

Made from stainless steel, case hardened and ground.

Factory approval

Each completely assembled device is tested for function and safety. Its quality is also controlled in accordance with DIN EN ISO 9001.

Safety

Hoist mechanism

Four-rope hoist mechanism with operating brake motor and highest safety capacity.

Safety brake

Integrated secondary brake with direct action on the winch drum, automatically triggered mechanism when cradle reaches excessive speed.

Mechanical devices

Electrical monitoring and automatic shut-off of all motors when end positions are reached. Independent emergency shut-off for all relevant safety movements.

Suspension ropes

Four-rope suspension system, independent action, with highest safety capacity and in accordance with the documented standards specified for that country.

Controls

Electrical, according to "dead man's" principle, run inside the wire rope—no power cord is required—control voltage 24 V.

Emergency shutdown

Specially marked emergency stop buttons at every control panel.

Automatic overload shutdown

Protects the machine from illegal overload and consequential breakdown.

Jib adjustment

Via self-locking spindle system with automatic interceptor device.

Traversing gear

With emergency support for wheel units or with robust gripping clamps for track-based systems as security against lifting or derailing.

Track clamps

For storm protection (only with track-based systems)

Cable reel

To secure and easily reel on and wind up the AC power line with cable reel limit switch to automatically switch off the horizontal movement and protect the power cable.

Hoist mechanism

MANNTech has over 55 years of experience in developing and manufacturing hoist units in various types and sizes to meet the highest safety standards.



Single-layer hoist unit



Multi-layer hoist unit



High-performance hoist unit, approx. 4,000 kg lifting capacity



Examples of modifications and additional components for Type 1 Series

I. Modifications (summary)

Individual solutions for customisation of a structure's special features, for example:

- Track gauge
- Jib configuration
- Single- and multi-layer hoists with hoist capacity currently at 4,000 kg and hoisting height capacity of 500 m
- Power supply voltage and frequency
- Cradle (platform) sizes

II. Additional components

- Auxiliary hoist to transport glass panels and façade elements outside the cradle (platform)
- Rotating head for cradle (platform) guidance and consequent improvement of operating conditions
- Mullion guide systems for safe operation on buildings in windy conditions
- Foam face rollers for safe and comfortable movement parallel to the façade
- Telephone communication between cradle (platform) and roof car via control device in the ropes
- Emergency call to building (central control technology)
- Safety belts, tarpaulin for cradle (platform), etc.
- Wind speed indicator with visual and/or acoustic warning signal
- Retractable jib arms for garage/parking position
- Additional custom modifications as necessary



Rotating head for cradle (platform) guidance and consequent improvement of operating conditions



Auxiliary hoist to transport glass panels and elements outside the cradle (platform)



Retractable jib arms for garage/parked position



Telephone communication between cradle (platform) and roof car via control device in the ropes



Additional foam face rollers for safe and comfortable movement parallel to the façade for protection of both platform and façade

Crane type machines

Type 4 and Type 6 Series

These crane type machines are composed and modified from a comprehensive modular design to suit each building geometry and height. They can run on concrete runways, be installed on track systems or directly connected to the building structure.

These machines are mainly deployed in situations in which medium to large projections are required due to building terracing or obstacles on the roof.

The crane type machines with standard proportionate projections of up to 40 meters also bypass substantial building terraces. At the same time, efficient performance is guaranteed through the functionality built into each machine. They can be completely hidden from view in most cases and save money due to low cleaning cycle costs. Each Building Maintenance System we install is the start of a long-term relationship with that building.

The technical conception of our machines guarantees immediate operational readiness and high work performance on the façade due to simple handling combined with hands-on training in operation and safety for the operating and building management personnel.

Compact crane Type 4 Series

Type 4.1 Compact crane with horizontal tracks on roof

Type 4.2 Compact crane with vertical tracks along the parapet

Type 4.3 Compact crane on roofs with load-bearing concrete runway

Crane type machine Type 6 Series

Type 6.1 Crane type machine with horizontal track on roof

Type 6.2 Crane type machine with vertical track along roof parapet

Type 6.3 Crane type machine for use on roofs with load-bearing concrete runway

Type 6.4 Stationary crane type machine, anchored on roof

These crane type machines are characterised by a long jib with slewing head for standard reaches up to 40 meters. In practice, a single unit of this type, positioned correctly on the building, can service the entire building complex including all its terraces and annexes.

Typically, the machines either run on horizontally laid tracks or they are anchored to the building in a stationary position.

They are also often made to telescope vertically to an operating position that clears all roof obstructions, while parking below and between the obstructions in order to be hidden from sight.

Crane type machine in compact design with central, overhead slewing jib and slewing head. Especially suitable where medium reach is necessary due to building terraces, recesses, protrusions or obstacles on the roof.

With the slewing head located on the jib point, the cradle can always be positioned parallel to the building façade.

With its stationary powerhouse and slender architecture it is particularly suitable for narrow passageways and small track gauges.

Type 6.1 with telescopic jib and lowering device for minimum height in parked position

Type 4.1 with fixed jib, track-based



Type 4.1—Compact crane with horizontal track on roof

Track-based compact crane Type 4.1 suitable for buildings with sufficient space on the roof for the installation of a track mechanism.

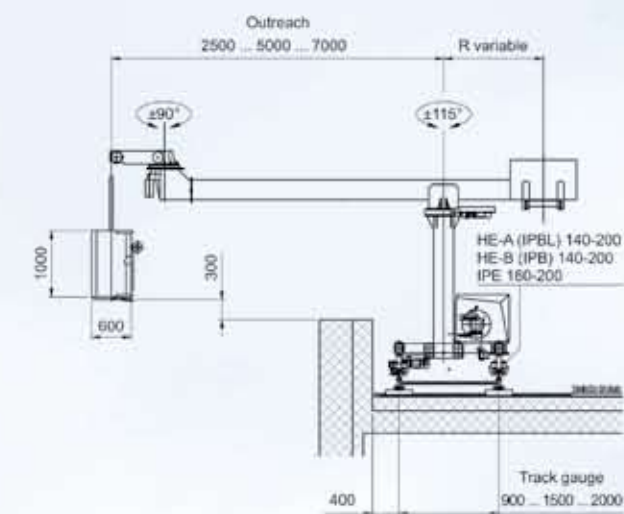
Where track gauge allows, the track mechanism can either be independently laid (i.e. without penetration of roof membrane and compression load only on the support points, optionally insulated decoupling) or implemented as an anchored rail system for transmission of tension loads.

If required, the entire device can be steered into a garage or parking position using a shunting car.



Type 4.1 with donkey wheel and emergency system for sloped track sections (this example 7°)

Typical standard data for this series



All units metric—also available in SI		
Hoist mechanism	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg
Height coverage (standard)	120 m	280 m / 220 m
Rope diameter	7 mm	7 mm / 8 mm
Rope safety factor according to EN 1808	>12	>12
Lifting speed	~11 m/min	~11 m/min
Traversing speed	~10 m/min	~10 m/min
Length of power cable	20 m	20 m

Type 4.2—Compact crane with vertical track along the parapet

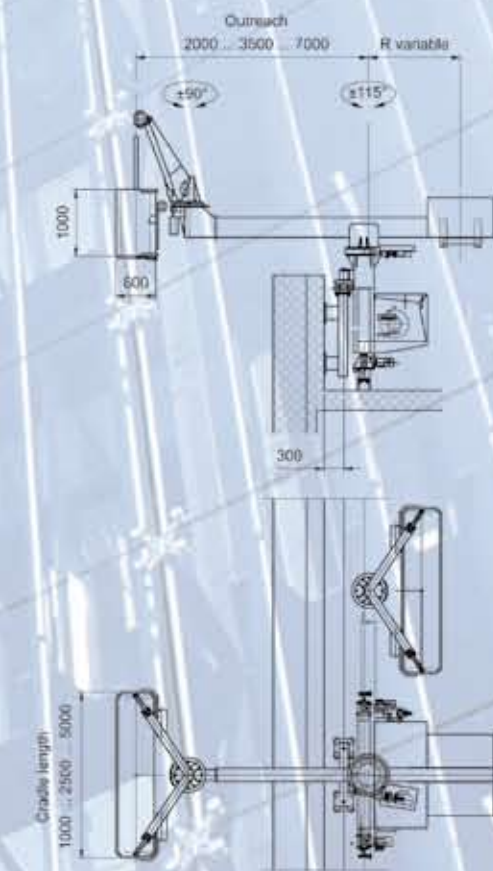


Type 4.2 low profile design with high V-head

Track-based compact crane Type 4.2, where track construction is anchored to the load-bearing parapet. It is also suitable for sloped tracks.

Preferred installation on buildings where roofs are non-load-bearing and/or where there is insufficient space on the roof as well as buildings with extremely high parapets.

Typical standard data for this series



All units metric—also available in SI		
Hoist mechanism	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg
Height coverage (standard)	120 m	280 m / 220 m
Rope diameter	7 mm	7 mm / 8 mm
Rope safety factor according to EN 1808	>12	>12
Lifting speed	~11 m/min	~11 m/min
Traversing speed	~10 m/min	~10 m/min
Length of power cable	20 m	20 m

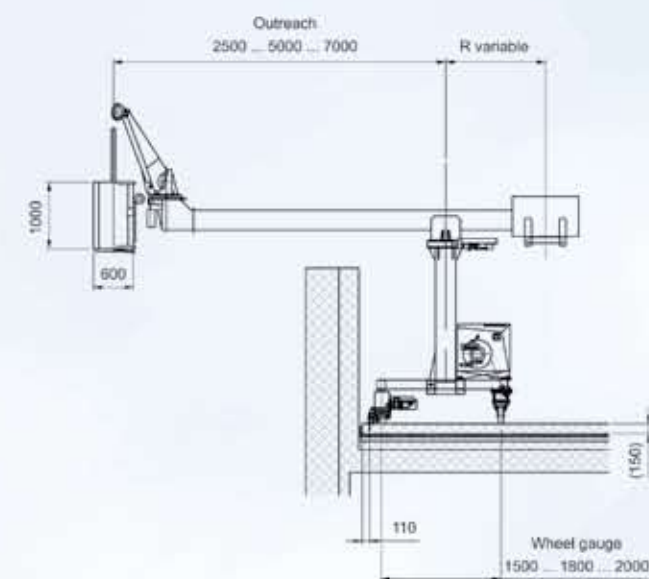
Type 4.3—Compact crane with load-bearing concrete runway

Trackless compact crane machine Type 4.3 for application on building roofs with load-bearing concrete runway.

The machine moves on large-dimensioned wheels with durable Polyurethane tyres controlled on guide rails or parapet and can be mechanically anchored if required.

The concrete runway can be configured so that the machine can be placed in a parked position and stored away from the building-edge.

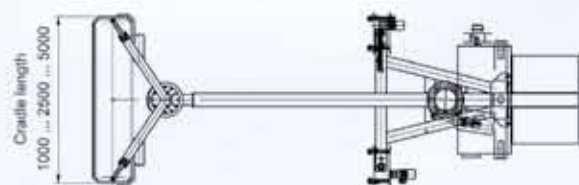
Typical standard data for this series



Type 4.3 with guide rail on the roof



Type 4.3 with guide rail along parapet



All units metric—also available in SI

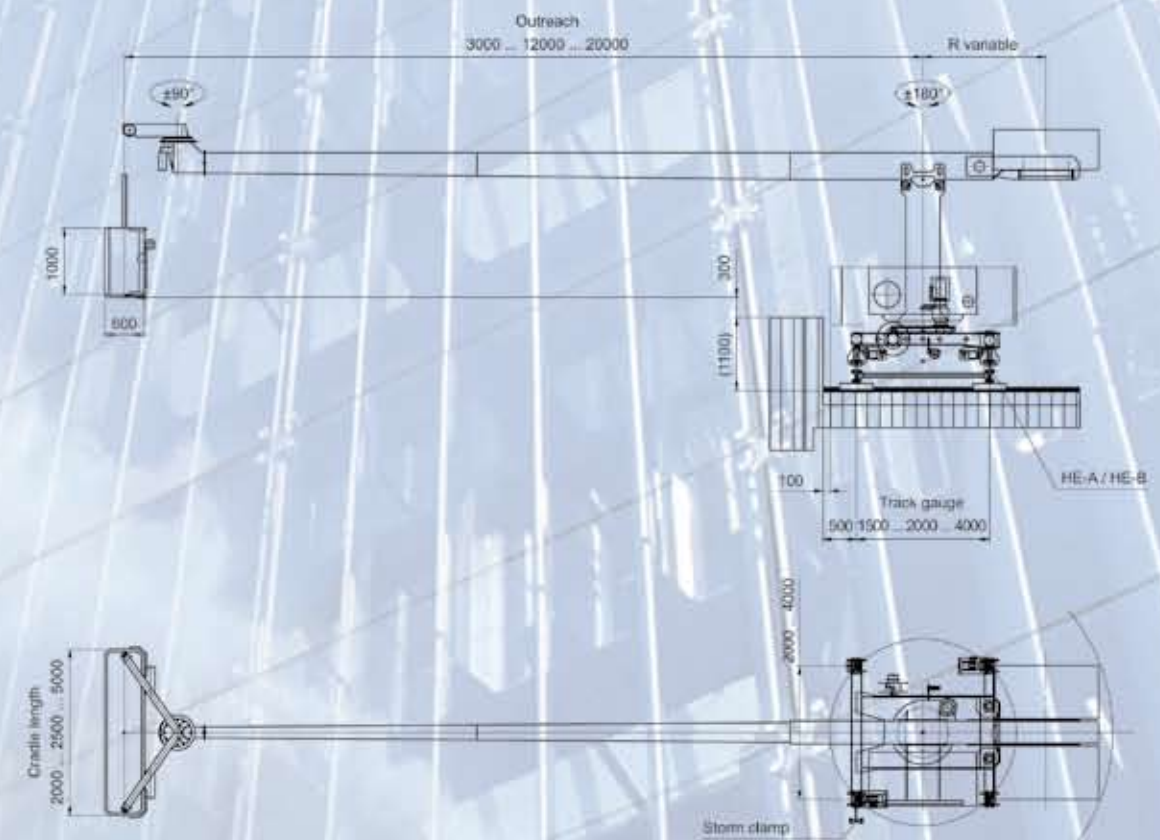
Hoist mechanism	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg
Height coverage (standard)	120 m	280 m / 220 m
Rope diameter	7 mm	7 mm / 8 mm
Rope safety factor according to EN 1808	>12	>12
Lifting speed	~11 m/min	~11 m/min
Traversing speed	~10 m/min	~10 m/min
Length of power cable	20 m	20 m

Type 6.1—Crane type machine with horizontal track on roof



Type 6.1 with standard slewing head and fixed mast

Examples of technical data for this series



All units metric—also available in SI

Hoist mechanism	Single-layer	Multi-layer	Multi-layer	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg	240 kg	240 kg	240 kg
Height coverage (standard)	39 m	120 m	280 m / 220 m	370 m	465 m
Rope diameter	7 mm	7 mm	7 mm / 8 mm	8 mm	10 mm
Rope safety factor according to EN 1808	>12	>12	>12	>12	>12
Lifting speed	~10 m/min	~11 m/min	~11 m/min	~11 m/min	~10 m/min
Traversing speed	~10 m/min	~10 m/min	~10 m/min	~10 m/min	~10 m/min
Length of power cable	20 m	20 m	20 m	20 m	20 m

Type 6.2—Crane type machine with vertical track along parapet



Type 6.2 with telescopic slewing mast and maintenance platform for hidden parking position

Type 6.3—Crane type machine for use on roofs with load-bearing concrete runway

Type 6.3 with luffing jib and coupling bar for slewing head alignment



Type 6.4—Stationary crane type machine, anchored on roof



Type 6.4 with telescopic jib and double telescopic slewing mast

Type 6.4 with extremely high telescopic slewing mast



Type 6 Series—Telescopic jib

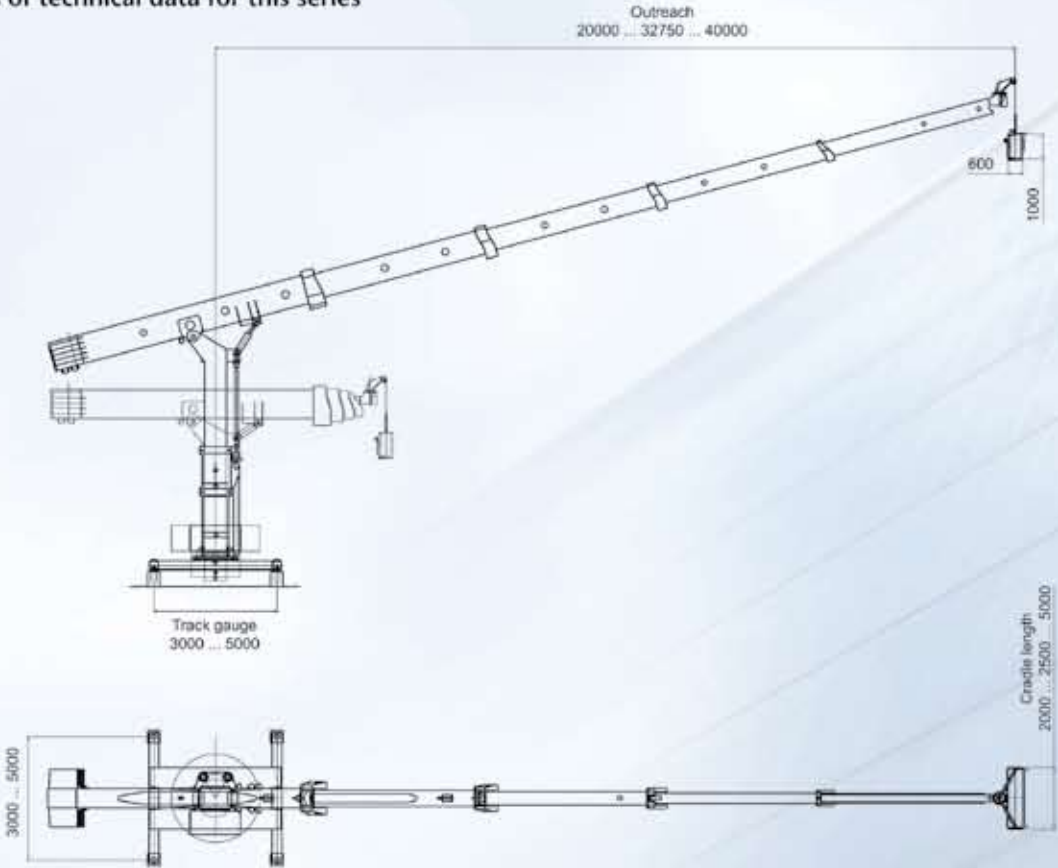


Type 6.4, stationary with lowering device and quadruple telescopic jib (machine is completely retractable on the roof)



Type 6.1 in low profile construction with double telescopic jib, track system integrated in green roof system

Examples of technical data for this series



All units metric—also available in SI

Hoist mechanism	Single-layer	Multi-layer	Multi-layer	Multi-layer
Rated working load (standard)	240 kg	240 kg	240 kg	240 kg
Height coverage (standard)	39 m	120 m	280 m / 220 m	370 m
Rope diameter	7 mm	7 mm	7 mm / 8 mm	8 mm
Rope safety factor according to EN 1808	>12	>12	>12	>12
Lifting speed	~10 m/min	~11 m/min	~11 m/min	~11 m/min
Traversing speed	~10 m/min	~10 m/min	~10 m/min	~10 m/min
Length of power cable	20 m	20 m	20 m	20 m



Type 6.1 with quadruple telescopic jib and vertical telescope mast, completely retractable on the roof



Type 6.1 with lowering device, triple telescopic jib and satellite cradle for reaching recesses in building



Type 6.4 with quadruple telescopic jib, slewing device and telescopic mast. Unit assembled at factory for testing and mounted on building roof

Telescopic jib

Type 6 Series—Articulated jib



Type 6.1, track-based with horizontal slewing articulated jib



Type 6.4, stationary with horizontal slewing articulated jib for minimal parking position on a circular building



Type 6.1, track-based with vertical slewing articulated jib to reach recessed building areas



Type 6.1, track-based with vertical slewing articulated jib to reach recessed building areas

Type 6 Series—Luffing jib



Type 6.1, track-based with fixed luffing jib and horizontal slewing articulation



Type 6.1, track-based with fixed luffing jib, low-profile design

Type 6.1, track-based with fixed luffing jib and mechanism (load-bearing hoist) for transportation of a Type 1.1 machine to various parts of the building



Technical specifications Type 4 and Type 6 Series

Function

Cradle (platform)

Ascends and descends with electrically powered safety hoisting gear, optionally as single or multi-layer hoist.

Jib/slewing head

When combined, they enable the cradle (platform) to be positioned parallel to the façade, to negotiate terracing, protrusions, recesses and allow safe landing on roof.

Jib systems

Fixed jib or telescopic as well as additionally with single or multiple articulated jib and/or luffing device, according to requirements.

Traversing gear

Horizontal movement using multiple electrically driven carriages with brakes.

Controls

All movements can be controlled from the cradle as well as from the roof car via panels. Key-operated and electrical interlock to avoid maloperation.

Quality

Steel structure

Galvanised construction for maximum corrosion resistance, exposed parts mainly made from non-ferrous materials. Primed and painted in RAL colours for optimal corrosion protection.

Suspension ropes

Galvanised high tensile steel ropes with individual certification. Integrated controls ensure safe transmission of signals between roof car and cradle (platform).

Rope guidance

Secure and precise rope guidance for single or multi-layered safety hoisting gear of the four independent suspension ropes. Pulleys with large diameter made of PA6 (high tensile plastics) for maximum long-lasting rope performance.

Components

From tried and tested systems; dimensioned and optimised solutions based on computer-aided calculation programs.

Cradle (platform)

Aluminium construction with rope suspension attachment made from high tensile steel, rope adjustment and excessive load device.

Electrical components

Only brand-name products are used with high protection levels against moisture, dirt and extreme environmental influences.

Slewing motion

Highly dimensioned ball-bearing slewing rim powered by multi-level gear brake motor.

Factory approval

Each completely assembled device is tested for function and safety. Its quality is also controlled in accordance with DIN EN ISO 9001.

Safety

Hoist mechanism

With gear brake motor. Service brakes optional as squirrel cage rotor brake motor.

Safety brake

Integrated secondary brake with direct action on the winch drum, automatically triggered mechanism when cradle reaches excessive speed.

Mechanical drives

Electrical monitoring and automatic shut-off of all motors when end positions are reached. Independent emergency shut-off for all relevant safety movements.

Suspension ropes

Four-rope suspension system, independent action, with highest safety capacity and in accordance with the documented standards specified for that country.

Controls

Electrical, according to "dead man's" principle, run inside the wire rope—no power cord is required—control voltage 24 V.

Automatic overload shutdown

Protects the machine from illegal overload and consequential breakdown.

Main jib

Box-shaped structure fixed with ball-bearing slewing rim to the mast of roof car. Weight compensation handled by counter-weight at jib end.

Telescopic jib

Using two separate adjustment drives; optional electronic synchronisation control for lifting and telescope movements.

Traversing gear

With robust gripping clamps to prevent lifting or derailing (only with track-based systems).

Emergency shutdown

Specially marked emergency stop button on every control panel.

Track clamps

For storm protection (only with track-based systems)

Jib-bracing device

Protects the jib slewing system when in parked position during storms.

Cable reel limit switch

Automatic shut-off of horizontal movement and protection of power cable.

Hoist mechanism

MANNTTECH has over 55 years of experience in developing and manufacturing hoist units in various types and sizes to meet the highest safety standards.



Single-layer hoist unit



Multi-layer hoist unit



High-performance hoist unit, approx. 4,000 kg lifting capacity



Examples of modifications and additional components for Type 4 and Type 6 Series

I. Modifications (summary)

Individual solutions for customisation to a structure's special features, for example:

- Track gauge; outreach, height of luffing mast
- Individual jib configuration
- Single- and multi-layer hoists with hoist capacity currently at 4,000 kg and hoisting height capacity of 500 m
- Power supply voltage and frequency
- Special cradle (platform) sizes and designs
- Manually retractable V-shaped arms for parking position

II. Additional components

- Automatic control of all motion using tried and tested software and hardware components
- Individual control software
- Cradle (platform) lever
- Safety belts and tarpaulin for cradle (platform)
- Wind speed indicator with visual or acoustic warning signal
- Cradle-changing device
- Slewing head with asymmetrical cradle (platform) attachment for circumnavigating obstacles
- Auxiliary hoist to transport glass panels and façade elements outside the cradle
- Various cradle (platform) guidance systems for safe operation on buildings in windy conditions
- Telephone communication between cradle and roof car
- Emergency call to building (central control technology)
- Additional horizontal articulation/double or triple articulation of the jib
- Hydraulically operated telescopic slewing mast to lower jib in parking position
- Various satellite cradle solutions for reaching recesses in building
- Customised cradle (platform) solutions to suit building requirements
- Additional custom modifications as necessary



Slewing head with asymmetrical cradle attachment for circumnavigating obstacles



Customised cradle (platform) solutions to fit building requirements

Customised cradle (platform) 15 m long for replacing large façade elements



Auxiliary hoist to transport glass panels and façade elements outside the cradle—movable or fixed installation

Cradle-changing device



Hydraulically operated telescopic slewing mast



Various cradle (platform) guidance systems for safe operation on buildings in windy conditions

Various satellite cradle solutions for reaching recesses in building



Some examples of special designs



Rose Rotana Hotel, Dubai: In domed building, retractable crane type machine with twin jibs for optimal cleaning service

Testing rig in Mammendorf

Delftse Poort, Rotterdam: Automatic cleaning machine



Milad Tower, Iran: Sloped elevator for maintenance of tower cupola. Designed for extreme wind stress and seismological conditions

ING Bank, Amsterdam: Sloped track sections with a Type 6.1 machine, here with rack and pinion drive and slewing head in a special design



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